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Analytical Approximations

Volume 9

Cecil Hastings, Jr.

James P. Wong, Jr.

P-387 ✓

1 April 1953 *Bea*

Approved for OTS release

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Analytical Approximation

Bessel Function of Imaginary Argument: To better
than .0015 over $(2, \infty)$,

$$e^{-x} I_0(x) \doteq \frac{1}{\sqrt{2\pi x}} \left\{ 1 + \frac{.18}{x} \right\}.$$

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Analytical Approximation

Bessel Function of Imaginary Argument: To better
than .0001 over $(2, \infty)$,

$$e^{-x} I_0(x) \doteq \frac{1}{\sqrt{2 \pi x}} \left\{ 1 + \frac{.107}{x} + \frac{.204}{x^2} - \frac{.085}{x^3} \right\}.$$

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Analytical Approximation

Bessel Function of Imaginary Argument: To better than .00022 over $(4, \infty)$,

$$e^{-x} I_0(x) \doteq \frac{1}{\sqrt{2\pi} x} \left\{ 1 + \frac{.147}{x} \right\}.$$

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Analytical Approximation

Bessel Function of Imaginary Argument: To better
than .00002 over $(4, \infty)$,

$$e^{-x} I_0(x) \doteq \frac{1}{\sqrt{2 \pi x}} \left\{ 1 + \frac{.1188}{x} + \frac{.1273}{x^2} \right\} .$$

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Analytical Approximation

Bessel Function of Imaginary Argument: To better
than .0004 over (0,1),

$$e^{-x}I_0(x) \doteq \frac{1 + 1.42x}{1 + 2.406x + 1.794x^2} .$$

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